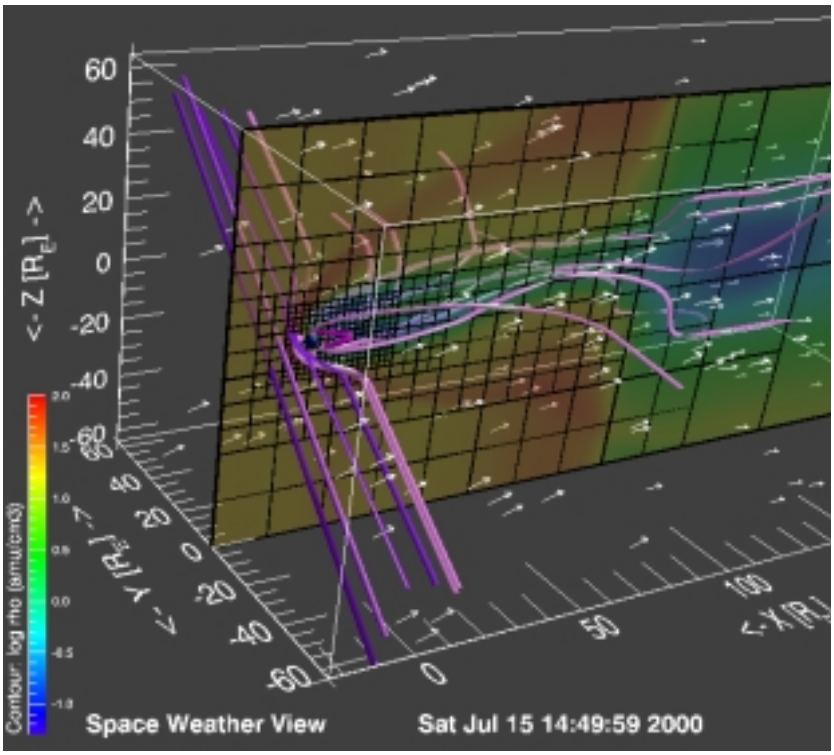
Space Weather View

The Community Coordinated Modeling Center
http://ccmc.gsfc.nasa.gov/~preitan/CCMC/SWV

Space Weather View (SWV) is a newly developed object-oriented visualization tool that uses IDL object graphics to visualize in 3D output from space weather models. Currently SWV displays output from the Block Adaptive Tree Solar-wind Roe Upwind Scheme (BATS-R-US), the first model selected for study by the Community Coordinated Modeling Center (CCMC). BATS-R-US is a magnetohydrodynamics (MHD) code developed at the University of Michigan for massively parallel computers using adaptive mesh refinement (AMR). The output from BATS-R-US is converted to the Hierarchal Data Format (HDF5) before being displayed with SWV. In the future, SWV will be enhanced to display output from other space weather models studied by the CCMC using HDF5 as the standard scientific data format.



SWV is an interactive program providing great flexibility and usability. The user can intuitively rotate, scale or translate the view volume by dragging the mouse in the draw window. The user can view an entire volume, an isosurface, vectors, flow lines, and up to three cut planes at a time. The cut planes can be moved by dragging a slider. In addition, the animation features of SWV enable the user can view output from different time steps.

The SWV image (above) is from a simulation run by CCMC scientists of the July 15, 2000 space weather event using data from the Geotail-MGF instrument. The magnetic field lines are represented by purple (interplanetary), magenta (closed), and pink (open) tubes. SWV's animation features enable CCMC scientists to analyze the changes in magnetic field topology during substorms. A meridonal cut through the density (*N*) distribution is shown using a semi-transparent contour plane. The adaptive computational grid is also displayed on the cut plane. The plasma velocity (*V*) is indicated with 200 white arrows randomly dispersed through out the volume.